

Bereskin & Parr

INTELLECTUAL PROPERTY LAW

Appl. No : 09/621,234 Confirmation No.: 3325
Applicant : HENSHAW et al.
Filed : July 20, 2000
Title : VERTICAL CYLINDRICAL SKEIN OF HOLLOW FIBER
MEMBRANES AND METHOD OF MAINTAINING CLEAN FIBER
SURFACES
TC./A.U. : 1792
Examiner : FORTUNA, Ana M.
Docket No. : 4320-241
Customer No. : 001059

Board of Patent Appeals and Interferences
United States Patent and Trademark Office
P. O. Box 1450
Alexandria, Virginia 22313-1450

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RESPONSE TO NOTIFICATION OF NON COMPLIANT APPEAL BRIEF

This is in response to the Notification of Non-Compliant Appeal Brief mailed on June 6, 2008. A petition for a two-month extension of time is being filed herewith.

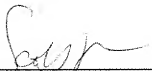
The response attaches a revised Summary of the Claimed Subject Matter and Claim Appendix. The Claim Appendix was not indicated to be non-compliant in the Notification. However, all claims involved in the appeal are being added by re-issue to an issued patent. Pursuant to MPEP 1454, such claims should be shown completely underlined. The revised Claims Appendix adds the required underlining to the claims involved in the appeal.

Regarding the revised Summary of the Claimed Subject Matter, the Notification states that the brief failed to provide a concise explanation of independent claims 1, 9, 13 and 15 referring to the specification by page and line number. Claims 1, 9 and 13 are not involved in the appeal. Accordingly, the Applicant submits that pursuant to 37 CFR 41.37(c)(1)(v) claims 1, 9, and 13 should not be included in the Summary of the Claimed Subject Matter. Regarding claim 15, the Summary of the Claimed Subject Matter has been revised to refer to the page and line number of the specification. Because this is a re-issue application, and each page of the specification includes two columns of the original patent, the column numbers have been retained to allow the Board to distinguish between the same line number in the two columns on a page.

The Applicants submit that the brief, as amended, complies with 37 CFR. 41.37.

Respectfully submitted,

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Summary of the Claimed Subject Matter

All references in the following paragraphs apply to the application as filed.

The appealed claims relate to a hollow fiber membrane filtration system used to filter or separate a permeate from a liquid substrate having particulate matter therein (page 3, column 5, line 58 to page 3, column 6, line 6).

The system has a non-pressurized reservoir (also called tank 90, page 9, column 17, lines 24 and 35; Figures 11 and 12) for containing the substrate. An assembly having a plurality of hollow fiber membranes is immersed in the substrate. Examples of such assemblies are shown in Figures 2, 3 and 6-9. One example of an assembly is skein 80, having fibers 12 and upper and lower end caps 81, 82 (see also Fig. 8, and page 8, col. 15, lines 40-46). Another example of a membrane assembly is skein 10, with upper and lower end caps 21, 22, hollow fiber membranes 12 (which may be called "membranes" or "fibers"), and upper and lower solid bodies 23, 24 (called headers, see page 11, column 22, line 36) with corresponding ends of the fibers fixed therein (see Fig. 2, and page 6, column 11, lines 25-59).

The membranes are sealingly secured in the solid bodies so as to prevent solids in the substrate from contaminating the permeate (page 4, column 7, lines 35-40). The solid bodies are comprised of a potting material, and at least a portion of the membranes are spaced apart by the potting material to a center to center distance in the range of 1.2 to 5 times the outside diameter of the membranes (page 4, column 7, lines 28-31). With such a spacing, the membranes do not touch each other but rather are spaced apart by the potting material between them (page 6, column 11, lines 43-47).

The system includes a "permeate pan" (page 6, column 4, line 65) in fluid communication with the lumens of the hollow fiber hollow fiber membranes. The permeate pan comprises, in one example, structure defining an upper permeate collection zone 28 provided by way of an upper end cap 21 (Fig. 2; page 6, col. 11, lines 26-29; page 6, col. 12, lines 41-44). A permeate pan can also define a lower permeate collection zone 29 in the lower end cap 22 (page 6, column 11, line 32). In other

examples the permeate pan comprises a stainless steel permeate pan 61 (Fig. 6; page 7, col. 14, lines 50-52).

The membranes have a defined length which is in the range of 0.1% to 5% greater than the distance between opposed surfaces of the solid bodies (page 4, column 8, lines 64-65).

A pump (page 9, column 17, lines 62-66) applies a suction to the lumens of the hollow fiber membranes to draw a component of the substrate (the permeate) through the membranes while leaving particulate matter in the substrate (page 9, column 17, lines 51-54).

A gas distribution system has through passages with openings distributed both radially and circumferentially between the membranes to discharge gas into the substrate and provide bubbles in the substrate. In one example, an air feed tube 44 communicates with arms 41 having discharge openings 43 therealong (Fig. 3; Fig. 3A; page 6, col. 12, lines 5 to 9). In another example, air supply tube 86 has ports 104 that may be threaded to receive the arms of a sparges (Fig. 8; page 8, col. 15, line 40 – page 8, col. 16, line 36).

CLAIMS APPENDIX

Claim 15. A system for withdrawing permeate from a liquid substrate while leaving particulate matter therein, comprising,

- (a) a non-pressurized reservoir other than a shell of a module for containing the substrate;
- (b) an assembly having a plurality of hollow fiber filtering membranes immersed in the substrate each membrane having a length greater than 0.5 m, the membranes together providing a surface area of at least greater than 1 m² and disposed generally vertically between upper and lower generally cylindrical solid bodies comprised of a potting material with (i) the solid bodies having the membranes sealingly secured therein so as to prevent the substrate from contaminating the permeate, at least a portion of the membranes spaced apart from adjacent membranes by the potting material to a center to center distance in the range from 1.2 to 5 times the outside diameter of the membranes, (ii) lumens of said membranes being in fluid communication with a permeate pan connected to one of the solid bodies and immersible in the substrate or to a pair of permeate pans connected one to each of the solid bodies and both immersible in the substrate, and, (iii) said membranes having a length between opposed surfaces of the solid bodies, in the range from 0.1% to 5% greater than the distance between opposed surfaces of the solid bodies;
- (c) a pump in fluid communication with said lumens of said membranes through at least one permeate pan, said pump operable to apply a suction to the lumens of the membranes to draw a component of the

- (d) substrate as permeate through said membranes while leaving particulate matter in said substrate; and.
- (e) a gas-distribution system having through-passages with openings distributed both radially and circumferentially between the membranes operable to provide a flow a gas through the through-passages to produce bubbles in the substrate.

Claim 16. The system of claim 15 wherein the length is in the range from 0.1% to 1% greater than the distance between the opposed surfaces of the [headers] solid bodies.

Clam 17. The system of claim 16 wherein the gas distribution system further includes a rigid air supply tube for carrying air to the through-passages and for spacing and positioning the lower and upper solid bodies relative to one another.

Claim 18. The system of claim 17 wherein the air supply tube has additional through-passages along its length.

Claim 24. The system of claim 15 wherein lower ends of the membranes are plugged.